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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the matter of:	)	
	)	
Guidelines for Evaluating the	)	ET Docket No. 93-62
Environmental Effects of	)	
Radiofrequency Radiation	)	

JOINT COMMENTS OF CBS INC., CAPITAL CITIES/ABC, INC., GREATER MEDIA, INC., TRIBUNE BROADCASTING COMPANY AND WESTINGHOUSE BROADCASTING COMPANY, INC.

January 25, 1994

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TABLE OF CONTENTS

Page

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These comments on the FCC's *Notice of Proposed Rulemaking* [hereinafter NPRM] in the above-captioned docket[1] are submitted jointly by CBS Inc. (CBS), Capital Cities/ABC, Inc. (Capital Cities), Greater Media, Inc., Tribune Broadcasting Company and Westinghouse Broadcasting Company, Inc. (Broadcast Joint Commenters). All these companies operate extensive television and/or radio broadcast facilities. Through these licensed facilities, the Broadcast Joint Commenters have served this nation for decades by providing free radio and TV service to the American public.

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[1] 8 F.C.C. Rcd 2849 (1993).

The instant proceeding was prompted by the 1991 revision by the Institute of Electrical and Electronics Engineers (IEEE) of the 1982 standard of the American National Standards Institute (ANSI) for RF radiation exposure.[2] The Commission currently mandates that at least certain licensed services comply with the 1982 ANSI standard.[3] The NPRM asks whether it would be appropriate for the agency to revise its regulations to encompass the new standard, which was adopted by ANSI as a voluntary U.S. standard in 1992.

As discussed below, the Broadcast Joint Commenters support updating the agency's rules to incorporate new scientific data so as to ensure continued protection of the public. In the past, the broadcast industry has been at the forefront of this effort, both in urging responsible Federal agencies to adopt RF standards and in working with the government, including the FCC, to develop specific compliance mechanisms. In this new phase of policy setting, the industry again commits itself to assisting the FCC on RF compliance.

Nonetheless, while the FCC must ensure protection of the public safety, it must also be careful to avoid onerous compliance requirements that bear little relation to real-world exposure risks. Such requirements could unnecessarily impede the continued provision of free broadcast service with little or no countervailing public interest benefits. Where risk to the public health has not been substantiated and the

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[2] IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, ANSI/IEEE C95.1-1992 [hereinafter ANSI/IEEE Standard].

[3] 47 C.F.R. § 1.1307 (1992).

revision to the regulations is prophylactic in nature -- such as is the case here -- logic and the law require that the regulations take into account the burdens placed on those subject to the regulatory scheme.

I. BACKGROUND AND SUMMARY

The Broadcast Joint Commenters fully support the Commission's effort to update RF radiation guidelines for the nation's telecommunications industries. To this end, the broadcast community has an unparalleled record of cooperation with the leading scientific and regulatory bodies to develop models and techniques for ensuring compliance with relevant exposure standards.

The FCC proposes to replace the 1982 ANSI RF exposure standard with the 1992 version adopted by the ANSI and IEEE. Although based on the same benchmark levels for maximum permitted exposure, the new standard differs in two significant ways from its predecessor. First, the new standard provides additional safety margins from the "controlled" environment exposure level and, thus, reduces permitted exposures in "uncontrolled" environments. Controlled environments are described as areas where prolonged exposure is incurred by persons aware of the potential for exposure or where exposure is incidental to transient passage. Second, the 1992 ANSI/IEEE standard also contains, for the first time, permitted exposure levels for induced currents and contact currents generated by RF fields. Notwithstanding the

likely increase in burdens on the broadcast industry, the Broadcast Joint Commenters support Commission adoption of the revised ANSI/IEEE standard.

The implementation of the standard, however, raises several important issues. First, we urge the Commission to adopt the ANSI/IEEE's dichotomy between controlled and uncontrolled environments in applying the new higher standard of protection, rather than applying a distinction based merely on whether a particular area may ever be "accessible" to the public. As discussed below, based on the available scientific evidence, ANSI/IEEE concluded that exposure to the levels of RF radiation permitted by the controlled standard should be "safe for all." [4] The more stringent, uncontrolled standard is therefore prophylactic in nature, providing an extra margin of safety in those areas where prolonged exposure of members of the general public to RF radiation is likely to occur. While such an extra measure of protection is, in our view, appropriate, it clearly goes beyond what has been shown to be necessary for the protection of human health; therefore, we believe it should be applied with due regard for its likely practical impact on broadcasters. As discussed in more detail below, by recognizing that the mere transient passage of members of the general public through an area exposed to an RF field need not invariably result in application of the higher standard, the ANSI/IEEE controlled/uncontrolled dichotomy reasonably takes the practical needs of broadcasters into account. Accordingly, the Broadcast Joint Comments favor adoption of the controlled/uncontrolled standard.

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[4] ANSI/IEEE Standard, § 6.

Second, the Broadcast Joint Commenters urge the Commission to specify clear, technically reliable and economically reasonable procedures for determining compliance with the new standards. Consistent with past practice, the FCC should allow broadcasters to assess compliance through the use of established calculation methods. In this regard, the Broadcast Joint Commenters are particularly concerned about demonstrating compliance with the new standards for induced and contact currents. Although actual field measurements sometimes may be necessary to establish compliance with these standards, requiring field measurements in all cases would be extremely costly to broadcasters with little benefit, since compliance can be adequately assured in many cases by calculation methods. More importantly, measurement procedures for these phenomena are at a very early stage of development and are now characterized by a lack of technological agreement as to how valid, repeatable measurements may be made. Indeed, induced current measurement devices are only now becoming available, and preliminary testing with both a prototype and a production model of one of these devices by CBS has revealed serious problems of reliability and repeatability. More study of how reliable, repeatable measurements can be attained -- and how such measurements can be translated into analytical compliance models -- will clearly be needed before compliance with the proposed induced and contact current standards can realistically and fairly be required.

With respect to the development of analytical compliance models, some analysis has been performed on induced currents. Much of the data on which this analysis is

based, however, were gathered in experiments reflecting disparate and often unrealistic conditions. Although the data derived from preliminary induced current measurement studies conducted by CBS must be treated with caution due to the problems of measurement reliability which were experienced, the Broadcast Joint Commenters have sufficient confidence in the consistency of the data to believe that further investigation may establish that currents induced by electrical fields below maximum permitted field exposure ("MPE") levels will not be in excess of the ANSI/IEEE limits, or at least that such currents will be induced only at significantly greater percentages of the MPE than the existing literature indicates. Additional study in this area is clearly required.

It is essential that the compliance models developed by the Commission rest on data compiled under actual field conditions, so that the standard is not more burdensome on broadcasters than is necessary for the protection of human health. The Commission should therefore work with affected parties to gather the necessary data to modify the Commission's Technical Bulletin Number 65 ("Technical Bulletin OST 65") to take account of the new standards, and to provide guidance to broadcasters in determining compliance. This modification must be performed prior to the compliance effective date. The commenters are prepared to work with the FCC to revise this document in a timely fashion.

Finally, in adopting the new RF radiation standards, the Commission should ensure that federal policies are not undermined by inconsistent state or local regulation. Prompted by unsubstantiated fears, several states and municipalities have already

prevented Commission licensees from fully deploying their systems and services in the manner contemplated by their FCC licenses. Some jurisdictions have even adopted their own RF exposure limits and compliance requirements. These limitations are often more restrictive than, or directly conflict with, those of the FCC. Therefore, the Commission should act promptly to institute a *Further Notice of Proposed Rulemaking* to assess the effects of state and local policies in this area. Policies that actually undermine the full and safe provision of services contemplated by the Communications Act should be preempted.

II. THE BROADCAST JOINT COMMENTERS TAKE THEIR NEPA COMPLIANCE RESPONSIBILITIES SERIOUSLY

A. Current Practices

Since 1986, broadcasters have been protecting persons at broadcast stations and the public by observing the previous ANSI standards. Indeed, broadcasters have been more widely subject to compliance obligations under the RF radiation standards than any other group. Unique among Commission licensees, broadcasters today are comprehensively regulated regarding RF radiation issues.

These compliance obligations derive from the current statutory and regulatory scheme. In the National Environmental Policy Act or "NEPA",[5] Congress directed the Federal government to "stimulate the health and welfare of man" by assuring "for all

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[5] Pub. L. No. 91-190, 83 Stat. 852 (1970) (codified at 42 U.S.C. §§ 4321-4370a (1988)).

Americans safe [and] healthful" surroundings.[6] At the core of NEPA is the requirement that Federal agencies consider "the environmental impact of [any major] proposed action."[7]

The FCC has responded to this mandate by adopting regulations that classify certain events as "major actions" (thus requiring the preparation of environmental impact statements (EIS) or environmental assessments (EA)).[8] In the case of potential effects of RF radiation, the FCC determined that the authorization of a facility which would result in persons being exposed to levels of RF radiation in excess of those specified in the 1982 ANSI standard constitutes such a major action.[9] In practice, compliance is assured when broadcast applicants certify to the Commission as part of their applications -- including renewal applications -- that nothing in their planned or actual operations will cause exposure of workers or the general public to RF radiation in excess of the 1982 ANSI standard. The Commission applied the ANSI standard to broadcast facilities (*i.e.*, Part 73) and some broadcast auxiliary stations (Part 74), as well as to experimental facilities and satellite earth stations.[10]

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[6] 42 U.S.C. §§ 4321, 4331(b)(2).

[7] *Id.* § 4332(C)(i).

[8] 47 C.F.R. §§ 1.1301-1319 (1992).

[9] *See* 47 C.F.R. § 1.1307(b) (1992) (citing Radio Frequency Protection Guides, American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz, ANSI C95.1-1982.)

[10] *See* Amendment of Part 1, 100 F.C.C.2d 543, 544 (1985). Subsequently, the Commission somewhat expanded the services subject to the ANSI rules. It also provided for categorical exclusions of

(continued...)

As a result, broadcasters must today ensure that no persons will be exposed to RF emissions in excess of the ANSI standards, as amplified in the Commission's Technical Bulletin OST 65.[11] This document, prepared by Dr. Robert Cleveland of the FCC's Office of Engineering and Technology, with input from the broadcast industry, contains specific guidance on how to predict and measure RF fields. Technical Bulletin OST 65 also provides worst-case "set-off" distances for broadcasters, *i.e.*, minimum ranges near antennas where persons should not be allowed. This permits broadcasters, in many cases, to determine compliance with the ANSI standards through reference to tables, mathematical equations and charts.

In short, using Technical Bulletin OST 65, broadcasters today efficiently protect the public from exposure to RF fields that exceed the 1982 ANSI guideline limits, while continuing to provide free broadcast services to the American public. In this connection, the broadcast industry has actively supported the development of appropriate standards and measurement procedures.[12]

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[10](...continued)
most other radio facilities. *See* 47 C.F.R. § 1.1307(b) note 1; Biological Effects of Radio Frequency Radiation, 2 F.C.C. Rcd 2064 (1987).

[11] Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation, Technical Bulletin OST 65 (Oct. 1985) [hereinafter Technical Bulletin OST 65].

[12] The broadcast industry has consistently favored adoption of meaningful, rational, scientifically-based RF emission standards to protect the public and employees from potential health risk due to exposure, and has urged government agencies, such as the EPA, to adopt such standards. *See* Comments of TV Broadcasters' All-Industry Committee, EPA Docket No. A-81-43 (filed Dec. 12, 1986).

B. New Proposals

The Commission's *NPRM* proposes replacing the reference in Section 1.1307 of the FCC rules to the 1982 ANSI standards with a reference to the new 1992 ANSI/IEEE standard.[13] The Commission acknowledges that "the greatest impact of the new guidelines will fall within the broadcast services."[14] The agency also notes that the complexity of the proposed standard and uncertainties as to the manner of its implementation make it "difficult to measure the exact impact on the broadcast community."[15]

After careful study of the new standards, the Broadcast Joint Commenters believe that they could have a significant impact on the broadcast industry. Initially, ANSI/IEEE C95.1-1992 for the first time adopts a two-tiered approach to exposure levels. The electrical and magnetic field maximum permissible exposure (MPE) for "controlled" areas in which RF radiation-emitting equipment is used remains substantially unchanged[16] and is designed to protect against the thermal effects of RF exposure. However, the 1992 standard requires that RF fields in "uncontrolled" areas -- including areas typically frequented by the general public -- must be generally reduced (in the relevant frequency range) to five times less than the field levels

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[13] 8 F.C.C. Rcd at 2850.

[14] *Id.* at 2861.

[15] *Id.*

[16] At certain frequencies, the magnetic field strength MPEs have been relaxed.

permitted in "controlled" areas. Second, the revised ANSI/IEEE standard for the first time contains an induced current standard, to address substantially the same thermal effects as the MPE. Finally, the new standard also for the first time specifies maximum permitted contact currents, which ensure against shocks and burns.

In the view of the Broadcast Joint Commenters, there can be no question that priority in this area must be given to public safety. To place the new proposals in context, however, it is important to bear in mind the ANSI/IEEE finding -- after extensive study -- that "no verified reports exist of injury to human beings or of adverse effects on the health of human beings who have been exposed to electromagnetic fields within the limits of frequency and SAR [specific absorption rate] specified by previous ANSI standards."[17] Indeed, based on the available scientific evidence, ANSI/IEEE concluded that the exposure limits for controlled environments should be "safe for all."[18] Given this ANSI/IEEE finding that there are no substantiated risks to human health from RF exposure within the 1982 limits, the FCC can, without prejudice to human health, proceed with careful deliberation in revising its rules, compliance requirements, and measurement techniques to assure their validity and feasibility.

Validated and practical compliance procedures especially will need to be developed to cover the induced current and contact current standards -- standards

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[17] ANSI/IEEE Standard, § 6.

[18] *Id.*

entirely new to both broadcasters and the FCC. Neither the NPRM nor the available ANSI/IEEE materials offer specific compliance procedures with regard to these standards. To avoid the potential for serious confusion, and perhaps even the disruption of some broadcast services, practical measurement and compliance procedures must be adopted before the new standard is implemented.

III. THE BROADCAST JOINT COMMENTERS SUPPORT THE FCC'S RELIANCE ON THE 1992 ANSI/IEEE STANDARD INCLUDING THE CONTROLLED/UNCONTROLLED DICHOTOMY

The Broadcast Joint Commenters support the Commission's proposal to substitute the revised 1992 ANSI/IEEE standard for the 1982 standard.[19] One of the most important aspects of the new standard is the ANSI/IEEE dichotomy between "controlled" and "uncontrolled" exposure environments. The use of a two-tiered exposure standard would be new to FCC regulations; therefore, the *NPRM* seeks comment on the dichotomy.[20]

The Broadcast Joint Commenters believe the controlled/uncontrolled dichotomy is appropriate, and is supported both by law and biology. The new standard permits exposure to RF radiation within previously existing ANSI limits (for those frequencies relevant to broadcasters) in controlled areas "where there is exposure that may be

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[19] *NPRM*, 8 F.C.C. Rcd at 2850 (guidelines "are more up to date with respect to scientifically-based criteria for use in evaluating human exposure to RF radiation.").

[20] *Id.* at 2850-51.

incurred by persons who are aware of the potential for exposure as a concomitant of employment, by other cognizant persons, or as the incidental result of transient passage."[21] In contrast to controlled areas, uncontrolled environments are defined as areas "where there is the exposure of individuals who have no knowledge or control of their exposure."[22] In such environments, the permitted exposures are five times lower than the controlled standard in most frequencies used by broadcasters.[23]

In considering implementation of the new standard, it is important to note that ANSI/IEEE adopted the more stringent requirements applicable to uncontrolled environments notwithstanding its finding, based on existing scientific evidence, that the exposure limits embodied in the controlled standard should be "safe for all."[24] In this connection, ANSI/IEEE found "no reliable scientific data . . . indicating that. . .[c]ertain subgroups of the population are more at risk [from RF exposure] than others."[25]

Notwithstanding the above findings, ANSI/IEEE nevertheless found that an extra margin of safety would be appropriate in environments where persons not aware

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[21] ANSI/IEEE Standard, § 2.

[22] *Id.*

[23] At frequencies in the lower VHF region and below, the magnetic field strength limits have been relaxed.

[24] ANSI/IEEE Standard, § 6.

[25] *Id. See also* Comments of the IEEE-United States Activities Committee on Man and Radiation, ET Docket No. 93-62, at 1 (filed Nov. 10, 1993) ("While some have argued that the justification for two tiers is that 'certain subgroups of the population are more at risk than others,' the new standard rejects this thesis.") [hereinafter IEEE COMAR].

of the potential hazards of RF exposure -- including members of the general public -- would be exposed to RF radiation for prolonged periods.[26] In short, the ANSI/IEEE standard for uncontrolled environments is a prophylactic one.

Given the prophylactic nature of the uncontrolled standard, ANSI/IEEE recognized the concept of "transient" exposure. Under this concept, an environment may still be considered "controlled" notwithstanding the fact that members of the general public, or other non-cognizant persons, may pass through it on a transient basis. Though not explicitly stated by ANSI/IEEE, the concept of transience is clearly based on the premise that it is safe for such persons to be exposed on a brief, non-recurring basis to levels of RF radiation in excess of the uncontrolled standard, but within the limits of the controlled exposure levels -- levels which ANSI/IEEE has explicitly found to be "safe for all."

The concept of transient exposure as part of the controlled environment standard is particularly important to broadcasters. It accommodates the reality that the public occasionally has access to areas around broadcast facilities. Nonetheless, transients are not subjected to appreciable risk under the new standard, because they: (1) will encounter exposure levels no greater than are safe for controlled personnel to face on a full-time basis; and (2) will encounter those levels on only isolated occasions associated with their temporary presence. As the similar guidelines of the National Council on

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[26] Thus, ANSI/IEEE noted that uncontrolled exposures "may occur in living quarters or work places where there are no expectations that [exposure may exceed the uncontrolled level]." ANSI/IEEE Standard, § 2.

Radiation Protection (NCRP) note, there is no scientific evidence that brief and isolated exposure to higher RF fields carries any substantiated risk:

> [E]xposure limits for the general population may unnecessarily inhibit activities that are brief and non-repetitive.... Because only small groups of the population would be exposed under these conditions, and almost certainly not on a repeated basis, the [higher] exposure levels are permitted for such cases.[27]

Recognition of the concept of transience will provide necessary certainty to broadcasters in applying the controlled/uncontrolled dichotomy, and will avoid the necessity of taking measures to comply with the standard which are both impractical and unnecessary to the protection of human health. For example, because AM transmitting arrays are sometimes located near roads and highways, portions of such roads may be subject to RF fields exceeding the uncontrolled standard. Since most persons may be expected quickly to drive through the field, the chances for exposure in excess of the uncontrolled standard on a time-averaged basis would be minimal. However, such exposures would not be impossible; for instance, a driver might be required to stop in the field to fix a flat tire. Since it obviously would be impossible for a broadcaster to ensure against such occurrences, unless exposures on the roadway are *defined* as transient -- which in fact they almost always will be -- and therefore not subject to the uncontrolled standard, a broadcaster's only compliance alternative would be to reduce power sufficiently to bring the portion of the roadway in question within

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[27] NCRP, Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields, § 17.4.4 (1986) [hereinafter NCRP Guidelines].

the uncontrolled standard. To require a broadcaster to take such measures to ensure against this kind of brief and non-recurring exposure in excess of the prophylactic uncontrolled standard would, we submit, be wholly disproportionate to any real risk to human health involved.[28]

Another example of the need for a transient exposure concept is mentioned by ANSI/IEEE in its discussion of this issue:

> [C]ontrolled environments may involve exposure of the general public as well as occupational personnel, e.g., in passing through areas such as an observation platform near a transmitting tower where analyses show the exposure may be above [uncontrolled levels] but is below [controlled levels].[29]

Because it can be reasonably assumed in many cases that individual members of the public will have access to such RF fields on a relatively brief and infrequent basis only, such environments should not automatically be reclassified as uncontrolled merely because they are accessible to the public.[30]

For the above reasons, the Broadcast Joint Commenters believe that the ANSI/IEEE standard is preferable to alternative approaches which would apparently apply the more stringent uncontrolled limits in any situation in which members of the general public, as opposed to cognizant workers, might be exposed to RF radiation in

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[28] Similar situations may arise with Part 74 transmitters, such as electronic news gathering equipment, that are unlikely to be nearby the public except on a non-repetitive and transitory basis.

[29] ANSI/IEEE Standard, § 6.

[30] *Cf. id.*, § 2.

excess of the uncontrolled standard, on however brief or non-recurring a basis. *See e.g.*, Comments of the Environmental Protection Agency. At the risk of repetition, we stress again the finding of ANSI/IEEE that no reliable scientific evidence exists of special subgroup vulnerability to RF radiation, and that exposures within the controlled standard should be "safe for all."[31]

In sum, there is no scientific consensus for concluding that the uncontrolled standard is *necessary* to protect anyone -- workers or members of the general public. The ANSI/IEEE standard represents a desirable prophylactic measure to provide an extra margin of safety *beyond* what existing science supports. As such, the uncontrolled standard should be applied with due regard to its practical effect on the broadcast industry. For the reasons stated above, the concept of transience in applying this standard is of considerable practical importance to broadcasters, and can be accommodated without any substantiated risk to the public health.

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[31] In its comments, the Environmental Protection Agency (EPA) disputes ANSI/IEEE's conclusion that no evidence exists of special population subgroup vulnerability to RF radiation. Environmental Protection Agency (EPA) Comments, ET 93-62, at 3 (filed Nov. 6, 1993). While EPA cites the findings of NCRP in support of its view, EPA is mistaken in its characterization of NCRP's position on this issue. Thus, NCRP did not find that any evidence of special subgroup vulnerability exists, but said only that "[t]he sensitivity of [subgroups] is not known." NCRP Guidelines, § 17.4.2. Similarly, while EPA claims that Food and Drug Administration (FDA) studies support its proposed worker/nonworker dichotomy, comments filed by FDA in this proceeding support (with an exception not relevant here) adoption of the revised ANSI/IEEE standard -- which includes the controlled/uncontrolled dichotomy. *See* Comments of the Department of Health and Human Services, Food and Drug Admin., ET Docket No. 93-62, at 1 (filed Nov. 17, 1993) [hereinafter FDA Comments] ("We feel that the replacement by the FCC of the ANSI C.95.1-1982 guidelines with most of the provisions of the ANSI/IEEE C95.1-1992 guidelines is appropriate and will provide a greater level of protection to the general public."). The Department of Defense concurs. *See* Department of Defense Comments, ET Docket No. 93-62, at 2 (filed Aug. 16, 1993) ("We recommend that the FCC adopt the RF exposure guidelines as published and as defined in ANSI/IEEE C95.1-1992.").

IV. THE COMMISSION SHOULD PROCEED CAUTIOUSLY BEFORE IMPLEMENTING COMPLIANCE OBLIGATIONS FOR INDUCED AND CONTACT CURRENT STANDARDS

The Broadcast Joint Commenters are particularly concerned about the potential impact on the broadcast industry of verifying compliance with the proposed standards for limiting human exposure to induced and contact currents.[32] Based on the preliminary induced current measurements conducted by CBS, the Broadcast Joint Commenters believe that scientific understanding of these phenomena -- and of the techniques and devices that will be needed to measure them -- have not yet developed to the point that would allow their measurement with sufficient reliability. Indeed, only a handful of induced and contact current meters exist at present, and one of these devices has yielded unrepeatable results in limited experimental use by CBS. Accordingly, the Broadcast Joint Commenters submit that it is at present premature to require compliance with these standards.

As discussed below, before broadcasters and others can fairly be obligated to meet the new guidelines, the Commission must specify with particularity human

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[32] The ANSI/IEEE Standard requires assessment of internal body currents when the human body is exposed to RF fields at frequencies below about 100 MHz. Electric fields reportedly cause induced currents to flow through the body, commonly through the legs and feet, to the ground or floor. Magnetic fields induce current flows that circulate about cross sections of the anatomy and tend not to exit the body. Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic fields - RF and Microwave, ANSI/IEEE C95.3-1992, § 1.4.3 [hereinafter ANSI/IEEE C95.3 Measurement Procedures], *cited in NPRM*, 8 F.C.C. Rcd at 2853 n.32. Similarly, the contact current standard is intended to minimize shock and burn hazards from electric field exposures by limiting the magnitude of the rms current that is allowed to flow from an exposed subject to ground. ANSI/IEEE Standard, § 6.7.

modeling and measurement techniques acceptable for standardized field measurements. Moreover, the Commission should also specify sound analytical techniques that enable broadcasters to determine compliance with the new induced and contact current standards in most circumstances without the need for field measurements, as it has done for electric field standards. The Broadcast Joint Commenters are prepared to assist the FCC in this process.

Any resulting delay in the implementation of the new induced and contact current standards would not place the public at any health risk; as noted above, ANSI/IEEE have emphasized that "no verified reports exist of injury to human beings or of adverse effects to the health of human beings who have been exposed to electromagnetic fields within the limits of frequency and SAR [specific absorption rate] specified by previous ANSI standards."[33] Moreover, the limited field measurements thus far taken by CBS -- while preliminary in nature and subject to the difficulties of measurement reliability which were experienced -- nonetheless suggest that compliance with the overall exposure standards could, in many cases, also protect against excessive induced currents; at the least, the CBS measurements suggest that compliance with the induced current standard may be achieved at relatively high percentages of maximum permitted field exposures.[34]

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[33] ANSI/IEEE Standard, § 6.

[34] As discussed in Section IV.C, *infra*, the Broadcast Joint Commenters believe that broadcasters can adequately protect against excessive contact currents as to tower workers simply through sound engineering practices, protective clothing and gloves.

A. The Commission Should Specify Standards of Compliance For the ANSI/IEEE Induced Current Guidelines

It would clearly be unreasonable for the Commission to require broadcasters to conform to a standard before anyone understands how compliance with that standard can be demonstrated. Such a rule would not only offend due process, it would also burden the Commission's staff with enforcing an unclear policy based on field measurements that may not be repeatable.

Yet, at present, neither the exposure standards in ANSI/IEEE C95.1 nor the measurement procedures detailed in ANSI/IEEE C95.3[35] define with any specificity what measurements can determine the level of induced currents. To the contrary, ANSI/IEEE C95.3 discusses only theoretical methods of measuring induced currents generated by electric fields, while noting in passing that the quantification of induced currents generated by magnetic fields poses a "major measurement challenge."[36] As a result, techniques for determining compliance with the induced current standard are hampered by the lack of real-world data relating the creation of induced currents to the relative strength of the electromagnetic field and frequency of operation.[37]

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[35] *See supra* note 32.

[36] ANSI/IEEE C95.3 Measurement Procedures, § 1.4.3.

[37] *See* S. Tofani, Induced Foot-Currents in Humans Exposed to Radio-Frequency EM Fields at 2, attached as Appendix A to Letter from Om P. Gandhi to Thomas Stanley, ET Docket No. 93-62 (filed Oct 28, 1993) ("[T]here is a lack of experimental data on foot currents induced by RF EM fields for frequencies in excess of 50 MHz.").

CBS's limited experience in measuring induced currents at various broadcast facilities confirms the difficulty of assessing compliance with the induced current standards. The attached Engineering Statement of Alan W. Parnau, Director, Transmission Systems of the CBS Radio Division, describes these difficulties.

As more fully described in the attached Statement, Mr. Parnau measured RF electrical field strength and induced currents at eight different broadcast facilities in New York and California in November 1993 and January 1994. In conducting these measurements, CBS experienced a variety of difficulties. For example, Mr. Parnau had continuing difficulty in calibrating or zeroing the meter in the vicinity of an RF field; the meter would simply fluctuate as Mr. Parnau's hand approached the meter. Moreover, meter readings would change significantly if Mr. Parnau leaned to one side or the other, bent over the meter, or stood upright. In addition, Mr. Parnau observed that measured current levels are highly dependent upon location. Moving the meter only a few feet resulted in significantly different readings. In sum, Mr. Parnau encountered great difficulty in obtaining identical measurements, even when he carefully repeated his precise procedures.

Before compliance with the new induced current standard can be required, therefore, much more work must be done to verify the accuracy and reliability of existing induced current meters, and to understand the relationship between induced currents and electrical fields under real-world conditions. This work can be done during the revision of Technical Bulletin OST 65, and the Broadcast Joint Commenters

are prepared to assist the FCC in this process. Until these necessary studies have been completed, however, it will not be possible to establish valid, standardized measurement procedures.[38]

In any event, requiring actual measurements in all cases as the only way of demonstrating compliance with the induced current standard would be extremely expensive and time consuming for broadcasters. The Commission's ultimate objective, therefore, should be to develop policies that permit broadcasters to verify their compliance by reference to standard formulas, graphs and tables, rather than by field measurements.[39] This would be analogous to the present version of Technical Bulletin OST 65, which contains analytical criteria for showing compliance with existing field exposure limits. Further, as discussed below, such compliance models should be based to the greatest extent possible on data compiled under actual field conditions, so as to insure that the standard is not made more restrictive on broadcasters than is necessary for the protection of human health.

As the Commission is aware, the National Association of Broadcasters ("NAB") commissioned a study of the relevant literature in the hope of developing "safe harbor"

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[38] In adopting standardized measurement procedures, it will also be necessary for the FCC to specify that test subjects be of a given height, since the level of body currents induced in a field will be particularly dependent on this factor.

[39] With respect to induced currents, most scientific evidence suggests that this phenomenon is peculiar to RF transmissions at frequencies below 100 MHz with HF and MF frequencies, *i.e.*, below 30 MHz, generating the most interest. This being the case, financially strapped AM broadcasters would bear a heavy burden were the Commission to rely solely on field measurements to ensure compliance with its RF standards. *See* Section IV.B.2, *infra*, for a further discussion on the appropriate frequency limits for the induced current standard.